Comparison of TO PEX/POSEIDON Altimetry Observations to an Eddy-Resolving Ocean General Circulation Model

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Observations of sea surface height and geostrophic velocity obtained from the TOPEX/POSEIDON (T/P) radar altimeters are compared to simulations from an eddy-resolving global ocean general circulation model, the Los Alamos Parallel Ocean Program (POP). An empirical tide model based on the Cartwright and Ray model plus the T/P data is employed to remove residual tide errors for the M2, S2, 01, and K1 constituents. The POP model uses a Mercator grid covering the global ocean from 78S to 78N with horizontal resolution ranging from 31 km at the Equator to 6.5 km at the highest latitudes, and 20 vertical levels. It was initialized to the temperature and salinity fields interpolated from Semtner and Chervin's 1/4 degree run, and spun up for 18 years, making two passes through the ECMWF monthly-mean winds covering the period from 1985 to 1993, and then run for an additional 9 years using 3-day mean ECMWF winds for the same period. S urface heat and freshwater fluxes were approximated by restoring to the seasonal Levitus climatology. Statistics from the final 9-year run are compared to the altimetry observations. Overall, the model results agree reasonably well with the magnitude and topographic location of eddy kinetic energy in the world ocean, although significant discrepancies appear in certain regions. Some problems with the mean currents that have traditionally plagued coarse resolution models, such as the separation points of western boundary currents, persist in the high-resolution simulations, suggesting the need for improved treatment of air-sea fluxes and subgrid-scale parameterizations. Results on comparison of other quantities such as eddy Reynolds stress, current ellipse, and wavenumber-frequency spectrum will be presented also.

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4. U
5. (a) U05 TOPEX/POSEIDON

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6. N/A
7. 0%
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9. C
10. None
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